

QP
1
W533

JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY

BOARD OF EDITORS

DETLEV W. BRONK, Managing Editor
The Rockefeller Institute for Medical Research

W. R. AMBERSON
University of Maryland

E. NEWTON HARVEY
Princeton University

L. IRVING
Arctic Health Research Center

M. H. JACOBS
University of Pennsylvania

E. K. MARSHALL, JR.
The Johns Hopkins University

G. H. PARKER
Harvard University

A. C. REDFIELD
Harvard University

H. W. SMITH
New York University

RAYMOND E. ZIRKLE
The University of Chicago

VOLUME 43
FEBRUARY, APRIL, JUNE
AND SUPPLEMENT No. 1 TO VOLUME 43, MAY, 1954

U. OF I.
LIBRARY

PUBLISHED BY

THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
PHILADELPHIA, PA.

C O N T E N T S

No. 1 FEBRUARY 1954

S. E. BRADLEY, G. H. MUDGE AND W. D. BLAKE. The renal excretion of sodium, potassium, and water by the harbor seal (<i>Phoca vitulina</i> L.): Effect of apnea; sodium, potassium, and water loading; pitressin; and mercurial diuresis. Six figures	1
GARY FELSENFELD. The binding of copper by hemocyanin. Two figures	23
KENNETH S. MILLS AND A. R. SCHRANK. Electrical and curvature responses of the avena coleoptile to unilateral ultraviolet irradiation. Five figures	39
CORNELIUS F. STRITTMATTER AND ERIC G. BALL. The intracellular distribution of cytochrome components and of oxidative enzyme activity in rat liver. Four figures	57
W. S. NEWCOMER. The occurrence of β -glucosidase in digestive juice of the cockroach, <i>Periplaneta americana</i> L. Two figures	79
ABRAHAM M. SHANES. Effects of sheath removal on the sciatic of the toad, <i>Bufo marinus</i> . One figure	87
ABRAHAM M. SHANES. Sodium exchange through the epineurium of the bullfrog sciatic. One figure	99
GEORGE K. SMELSER AND V. OZANICS. Effect of thyroid hormone on mitosis and regeneration in corneal epithelium. Two figures	107

No. 2 APRIL 1954

ERNEST B. WRIGHT AND WILLIAM J. ADELMAN. Accommodation in three single motor axons of the crayfish claw. Three figures	119
ERNEST B. WRIGHT AND PAUL D. COLEMAN. Excitation and conduction in crustacean single motor axons. Fourteen figures	133
J. S. BARLOW AND J. F. MANERY. The changes in electrolytes, particularly chloride, which accompany growth in chick muscle. Four figures	165

R. J. KUTSKY AND MORGAN HARRIS. Growth promoting agents in cell fractions of chick embryos	193
JOHN O. HUTCHENS AND BETTY PODOLSKY. The effect of nitrogen mustards on cell division in <i>Chilomonas paramecium</i> and <i>Saccharomyces cerevisiae</i> . Seven figures	205
BETTY PODOLSKY AND JOHN O. HUTCHENS. Some effects of nitrogen mustards on metabolism of <i>Chilomonas paramecium</i> and <i>Saccharomyces cerevisiae</i> . Six figures	229
FLORENCE M. HARRISON AND ARTHUR W. MARTIN. Calcium distribution and conservation during the molting period in <i>Limnoria lignorum</i> (Rathke). Three figures	247

No. 3 JUNE 1954

LOT B. PAGE, J. C. SCOTT-BAKER, G. A. ZAK, E. L. BECKER AND C. F. BAXTER. The effect of variation in filtration rate on the urinary concentrating mechanism in the seal, <i>Phoca vitulina</i> L. Two figures	257
A. A. ANDREASEN AND T. J. B. STIER. Anaerobic nutrition of <i>Saccharomyces cerevisiae</i> . II. Unsaturated fatty acid requirement for growth in a defined medium. One figure	271
K. PAMPAPATHI RAO AND EDWARD D. GOLDBERG. Utilization of dissolved calcium by a Pelecyopod. One figure	283
J. HYDE, C. M. RIGGLE AND E. GELLHORN. The dependence of unit discharges on frequency and intensity of stimulation of the motor cortex in the macaque. Five figures	293
JULIUS PRAGLIN. The excitation of single striated muscle fibers. Eleven figures	311
A. VAN HARREVELD AND F. E. RUSSELL. Ionic migration in isolated nerves. One figure	335
A. ROSENBLUETH, J. GARCIA RAMOS AND R. MILEDI. The propagation of impulses in myelinated axons. Six figures	347
BETTY DANES, G. S. CHRISTIANSEN AND P. J. LEINFELDER. Interrelationships between cellular respiration and cell growth in tissue culture. Three figures	365
L. G. ABOOD AND R. W. GERARD. Enzyme distribution in isolated particulates of rat peripheral nerve. Two figures	379
G. FALK AND R. W. GERARD. Effect of micro-injected salts and ATP on the membrane potential and mechanical response of muscle	393

E. GELlhORN, C. M. RIGGLE AND H. M. BALLIN. Summation, inhibition, and proprioceptive reinforcement under conditions of stimulation of the motor cortex and their influence on the activity of single motor units	405
G. HOYT WHIPPLE. Luminous bacteria as a radiobiological test organism. Two figures	415
TRAKUL KITISIN AND A. S. GILSON. The effect of changing temperature upon the time course of active and of passive lengthening of rabbit smooth muscle. Three figures	425

SUPPLEMENT No. 1 TO VOLUME 43, MAY, 1954

<i>Introduction</i> — Alexander Hollaender	9
JAMES G. WILSON. Differentiation and the reaction of rat embryos to radiation. One figure	11
ROBERTS RUGH. The effect of ionizing radiations on amphibian development. Four plates	39
JAMES N. DENT AND ERNEST L. HUNT. Radiotracer techniques in embryological research. Seven figures	77
LIANE BRAUCH RUSSELL AND W. L. RUSSELL. An analysis of the changing radiation response of the developing mouse embryo. Twelve figures	103
SAMUEL P. HICKS. The effects of ionizing radiation, certain hormones, and radiomimetic drugs on the developing nervous system. Eleven figures	151
DIETRICH BODENSTEIN. Effects of radiomimetic substances on embryonic development, with special reference to nitrogen mustards	179
JOSEF WARKANY. Disturbance of embryonic development by maternal vitamin deficiencies. Seven figures	207
F. CLARKE FRASER, H. KALTER, B. E. WALKER AND T. D. FAINSTAT. The experimental production of cleft palate with cortisone and other hormones. One figure	237
WALTER LANDAUER. On the chemical production of developmental abnormalities and of phenocopies in chicken embryos. Seven figures	261
B. H. WILLIER. Phases in embryonic development	307
JAMES N. YAMAZAKI, STANLEY W. WRIGHT AND PHYLLIS M. WRIGHT. A study of the outcome of pregnancy in women exposed to the atomic bomb blast in Nagasaki. Three figures	319
PAUL WEISS. Summarizing remarks	329

INDEX

ABNORMALITIES and of phenocopies in chicken embryos, on the chemical production of developmental Sup. 1
 ABOOD, L. G., AND R. W. GERARD. Enzyme distribution in isolated particulates of rat peripheral nerve 261
 Accommodation in three single motor axons of the crayfish claw 119
 ADELMAN, WILLIAM J. See Wright, Ernest B.
 Amphibian development, the effect of ionizing radiations on Sup. 1
 Anaerobic nutrition of *Saccharomyces cerevisiae*. II. Unsaturated fatty acid requirement for growth in a defined medium 39
 Analysis of the changing radiation response of the developing mouse embryo, an Sup. 1
 ANDREASEN, A. A., AND T. J. B. STIER. Anaerobic nutrition of *Saccharomyces cerevisiae*. II. Unsaturated fatty acid requirement for growth in a defined medium 271
 Apnea; sodium, potassium, and water loading; pitressin; and mercurial diuresis, effect of 103
 Atomic bomb blast in Nagasaki, a study of the outcome of pregnancy in women exposed to Sup. 1
 Avena coleoptile to unilateral ultraviolet irradiation, electrical and curvature responses of the 319
 Axons, excitation and conduction in crustacean single motor 39
 Axons of the crayfish claw, accommodation in three single motor 133
 Axons, the propagation of impulses in myelinated 119
BACTERIA as a radiobiological test organism, luminous 347
 BALL, ERIC G. See Strittmatter, Cornelius F.
 BALLIN, H. M. See Geilhorn, E. 57
 BARLOW, J. S., AND J. F. MANERY. The changes in electrolytes, particularly chloride, which accompany growth in chick muscle 405
 BAXTER, C. F. See Page, Lot B. 165
 BECKER, E. L. See Page, Lot B. 257
 Binding of copper by hemocyanin, the 23
 BLAKE, W. D. See Bradley, S. E. 1
 BODENSTEIN, DIETRICH. Effects of radiomimetic substances on embryonic development, with special reference to nitrogen mustards. Sup. 1
Bufo marinus, effects of sheath removal on the sciatic of the toad, 179
 Bullfrog sciatic, sodium exchange through the epineurium of the 87
 BRADLEY, S. E., G. H. MUDGE AND W. D. BLAKE. The renal excretion of sodium, potassium, and water by the harbor seal (*Phoca vitulina* L.): Effects of apnea; sodium, potassium, and water loading; pitressin; and mercurial diuresis 99
CALCIUM by a Pelecypod, utilization of dissolved 283
 Calcium distribution and conservation during the molting period in *Limnoria lignorum* (Rathke) 247
 Cell division in *Chilomonas paramecium* and *Saccharomyces cerevisiae*, the effect of nitrogen mustards on 205
 Cell fractions of chick embryos, growth promoting agents in 119
 Cell growth in tissue culture, interrelationships between cellular respiration and 193
 Cellular respiration and cell growth in tissue culture, interrelationships between 365
Cerevisiae, anaerobic nutrition of *Saccharomyces cerevisiae*, some effects of nitrogen mustards on metabolism of *Chilomonas paramecium* and *Saccharomyces cerevisiae*, the effect of nitrogen mustards on cell division in *Chilomonas paramecium* and *Saccharomyces* 229
 Changes in electrolytes, particularly chloride, which accompany growth in chick muscle, the 205
 Chemical production of developmental abnormalities and of phenocopies in chicken embryos, on the. Sup. 1 165
 Chick embryos, growth promoting agents in cell fractions of 261
 Chicken embryos, on the chemical production of developmental abnormalities and of phenocopies in 193
 Sup. 1 261
 Chick muscle, the changes in electrolytes, particularly chloride, which accompany growth in 165
Chilomonas paramecium and *Saccharomyces cerevisiae*, some effects of nitrogen mustards on metabolism in 229
Chilomonas paramecium and *Saccharomyces cerevisiae*, the effect of nitrogen mustards on cell division in 205
 Chloride, which accompany growth in chick muscle, the changes in electrolytes, particularly 165
 CHRISTIANSEN, G. S. See Danes, Betty 365
 Claw, accommodation in three single motor axons of the crayfish 119
 Cleft palate with cortisone and other hormones, the experimental production of Sup. 1 237
 Cockroach, *Periplaneta americana* L., the occurrence of β -glucosidase in digestive juice of the 79
 COLEMAN, PAUL D. See Wright, Ernest B. 133
 Coleoptile to unilateral ultraviolet irradiation, electrical and curvature responses of the avena 39
 Conduction in crustacean single motor axons, excitation and 133
 Copper by hemocyanin, the binding of 23
 Corneal epithelium, effect of thyroid hormone on mitosis and regeneration in corneal epithelium 107

Cortisone and other hormones, the experimental production of cleft palate with Sup. 1

Crayfish claw, accommodation in three single motor axons of the 119

Crustacean single motor axons, excitation and conduction in 133

Curvature responses of the avena coleoptile to unilateral ultraviolet irradiation, electrical and 39

Cytochrome components and of oxidative enzyme activity in rat liver, the intracellular distribution of 57

DANES, BETTY, G. S. CHRISTIANSEN AND P. J. LEINFELDER. Interrelationships between cellular respiration and cell growth in tissue culture 237

Defined medium, unsaturated fatty acid requirement for growth in a 271

DENT, JAMES N., AND ERNEST L. HUNT. Radiotracer techniques in embryological research Sup. 1

Dependence of unit discharges on frequency and intensity of stimulation of the motor cortex in the macaque, the 365

Differentiation and the reaction of rat embryos to radiation Sup. 1

Dissolved calcium by a Pelecypod, utilization of 283

Disturbance of embryonic development by maternal vitamin deficiencies Sup. 1

EFFECT of changing temperature upon the time course of active and of passive lengthening of rabbit smooth muscle, the 425

Effect of ionizing radiations on amphibian development, the Sup. 1

Effect of micro-injected salts and ATP on the membrane potential and mechanical response of muscle 39

Effect of nitrogen mustards on cell division in *Chilomonas paramecium* and *Saccharomyces cerevisiae*, the 393

Effect of thyroid hormone on mitosis and regeneration in corneal epithelium 205

Effect of variation in filtration rate on the urinary concentrating mechanism in the seal, *Phoca vitulina* L., the 107

Effects of ionizing radiation, certain hormones, and radiomimetic drugs on the developing nervous system, the 257

Effects of nitrogen mustards on metabolism of *Chilomonas paramecium* and *Saccharomyces cerevisiae*, some 151

Effects of radiomimetic substances on embryonic development, with special reference to nitrogen mustards Sup. 1

Effects of sheath removal on the sciatic of the toad, *Bufo marinus* 179

Electrical and curvature responses of the avena coleoptile to unilateral ultraviolet irradiation 87

Electrolytes, particularly chloride, which accompany growth in chick muscle, the changes in 39

Embryo, an analysis of the changing radiation response of the developing mouse Sup. 1

Embryological research, radiotracer techniques in Sup. 1

Embryonic development by maternal vitamin deficiencies, disturbance of 207

Embryonic development, phases in Sup. 1

Embryonic development, with special reference to nitrogen mustards, effects of radiomimetic substances on Sup. 1

Embryos, growth promoting agents in cell fractions of chick 179

Embryos, on the chemical production of developmental abnormalities and phenocopies in chicken Sup. 1

Embryos to radiation, differentiation and the reaction of rat Sup. 1

Enzyme activity in rat liver, the intracellular distribution of cytochrome components and of oxidative 57

Enzyme distribution in isolated particulates of rat peripheral nerve 379

Epineurium of the bullfrog sciatic, sodium exchange through the 99

Epithelium, effect of thyroid hormone on mitosis and regeneration in corneal 107

Excitation and conduction in crustacean single motor axons 133

Excitation of single striated muscle fibers, the 311

Experimental production of cleft palate with cortisone and other hormones, the Sup. 1

FAINSTAT, T. D. See Fraser, F. Clarke Sup. 1

FALK, G., AND R. W. GERARD. Effect of micro-injected salts and ATP on the membrane potential and mechanical response of muscle 393

FELSENFELD, GARY. The binding of copper by hemocyanin 23

Fibers, the excitation of single striated muscle 311

Filtration rate on the urinary concentrating mechanism in the seal, *Phoca vitulina* L., the effect of variation in 257

FRASER, F. CLARKE, H. KALTER, B. E. WALKER AND T. D. FAINSTAD. The experimental production of cleft palate with cortisone and other hormones Sup. 1

GELLHORN, E. See Hyde, J. 293

GELLHORN, E., C. M. RIGGLE AND H. M. BALLIN. Summation, inhibition, and proprioceptive reinforcement under conditions of stimulation of the motor cortex and their influence on the activity of single motor units 405

GERARD, R. W. See Abood, L. G. Also see Falk, G. 379

GILSON, A. S. See Kitisin, Trakul 393

GOLDBERG, EDWARD D. See Rao, K. Pampapathi 425

Growth promoting agents in cell fractions of chick embryos 283

HARBOR seal (*Phoca vitulina* L.), the renal excretion of sodium, potassium, and water by the 1

HARREVELD, A. VAN, AND F. E. RUSSELL. Ionic migration in isolated nerves 335

HARRISON, MORGAN. See Kutsky, R. J.

HAERRISON, FLORENCE M., AND ARTHUR W. MARTIN. Calcium distribution and conservation during the molting period in *Limnoria lignorum* (Rathke)

Hemocyanin, the binding of copper by HICKS, SAMUEL P. The effects of ionizing radiation, certain hormones, and radiomimetic drugs on the developing nervous system . . Sup. 1

HOLLAENDER, ALEXANDER. See *Introduction* Sup. 1

Hormone on mitosis and regeneration in corneal epithelium, effect of thyroid

Hormones, and radiomimetic drugs on the developing nervous system, the effects of ionizing radiation, certain Sup. 1

Hormones, the experimental production of cleft palate with cortisone and other Sup. 1

HUNT, ERNEST L. See Dent, James N. Sup. 1

HUTCHENS, JOHN O. See Podolsky, Betty

HUTCHENS, JOHN O., AND BETTY PODOLSKY. The effect of nitrogen mustards on cell division in *Chilomonas paramecium* and *Saccharomyces cerevisiae*

HYDE, J., C. M. RIGGLE AND E. GELLHORN. The dependence of unit discharges on frequency and intensity of stimulation of the motor cortex in the macaque

IMPULSES in myelinated axons, the propagation of

Inhibition, and proprioceptive reinforcement under conditions of stimulation of the motor cortex and their influence on the activity of single motor units, summation,

Interrelationships between cellular respiration and cell growth in tissue culture

Intracellular distribution of cytochrome components and of oxidative enzyme activity in rat liver, the

Introduction — Alexander Hollaender Sup. 1

Ion migration in isolated nerves

Ionizing radiation, certain hormones, and radiomimetic drugs on the developing nervous system, effects of Sup. 1

Ionizing radiations on amphibian development, the effect of Sup. 1

Irradiation, electrical and curvature responses of the avena coleoptile to unilateral ultraviolet

JUICE of the cockroach, *Periplaneta americana* L., the occurrence of β -glucosidase in digestive

KALTER, H. See Fraser, F. Clarke Sup. 1

KITISIN, TRAKUL, AND A. S. GILSON. The effect of changing temperature upon the time course of active and of passive lengthening of rabbit smooth muscle

KUTSKY, R. J., AND MORGAN HARRIS. Growth promoting agents in cell fractions of chick embryos

193 **L**ANDAUER, WALTER. On the chemical production of developmental abnormalities and of phenocopies in chicken embryos Sup. 1

LEINFELDER, P. J. See Danes, Betty . .

Lignorum (Rathke), calcium distribution and conservation during the molting period in *Limnoria lignorum* (Rathke), calcium distribution and conservation during the molting period in

Luminous bacteria as a radiobiological test organism

107 **M**ACAQUE, the dependence of unit discharges on frequency and intensity of stimulation of the motor cortex in the

MANERY, J. F. See Barlow, J. S.

Marinus, effects of sheath removal on the sciatic of the toad, *Bufo*

MARTIN, ARTHUR W. See Harrison, Florence M.

Maternal vitamin deficiencies, disturbance of embryonic development by Sup. 1

229 Membrane potential and mechanical response of muscle, effect of micro-injected salts and ATP on the

Metabolism of *Chilomonas paramecium* and *Saccharomyces cerevisiae*, some effects of nitrogen mustards on

205 Migration in isolated nerves, ionic

MILEDI, R. See Rosenblueth, A.

MILLS, KENNETH S., AND A. R. SCHRANK. Electrical and curvature responses of the avena coleoptile to unilateral ultraviolet irradiation

293 Mitosis and regeneration in corneal epithelium, effect of thyroid hormone on

347 Molting period in *Limnoria lignorum* (Rathke), calcium distribution and conservation during the

405 Motor axons, excitation and conduction in crustacean single

365 Motor axons of the crayfish claw, accommodation in three single

57 Motor cortex and their influence on the activity of single motor units, summation, inhibition, and proprioceptive reinforcement under conditions of stimulation of the

335 Motor cortex in the macaque, the dependence of unit discharges on frequency and intensity of stimulation of the

151 Mouse embryo, an analysis of the changing radiation response of the developing Sup. 1

39 MUDGE, G. H. See Bradley, S. E.

39 Muscle, effect of micro-injected salts and ATP on the membrane potential and mechanical response of

79 Muscle fibers, the excitation of single striated

237 Muscle, the changes in electrolytes, particularly in chloride, which accompany growth in chick

425 Muscle, the effect of changing temperature upon the time course of active and of passive lengthening of rabbit smooth

425 Mustards, effects of radiomimetic substances on embryonic development, with special reference to nitrogen Sup. 1

193 293

261 365

247

247

247

415

293

165

87

247

207

393

229

335

347

39

107

247

133

119

405

405

293

103

1

393

311

165

425

179

Mustards on cell division in *Chilomonas paramecium* and *Saccharomyces cerevisiae*, the effect of nitrogen 205

Mustards on metabolism of *Chilomonas paramecium* and *Saccharomyces cerevisiae*, some effects of nitrogen 229

Myelinated axons, the propagation of impulses in 347

NAGASAKI, a study of the outcome of pregnancy in women exposed to the atomic bomb blast in . Sup. 1

Nerve, enzyme distribution in isolated particulates of rat peripheral 319

Nerves, ionic migration in isolated 379

Nervous system, the effects of ionizing radiation, certain hormones, and radiomimetic drugs on the developing Sup. 1

NEWCOMER, W. S. The occurrence of β -glucosidase in digestive juice of the cockroach, *Periplaneta americana* L. 151

Nitrogen mustards, effects of radiomimetic substances on embryonic development, with special reference to Sup. 1

Nitrogen mustards on cell division in *Chilomonas paramecium* and *Saccharomyces cerevisiae*, the effect of 179

Nitrogen mustards on metabolism of *Chilomonas paramecium* and *Saccharomyces cerevisiae*, some effects of 205

Nutrition of *Saccharomyces cerevisiae*, anaerobic 229

OCCURRENCE of β -glucosidase in digestive juice of the cockroach, *Periplaneta americana* L., the 79

On the chemical production of developmental abnormalities and of phenocopies in chicken embryos . Sup. 1

Oxidative enzyme activity in rat liver, the intracellular distribution of cytochrome components and of 261

OZANICS, V. See Smelser, George K. 57

PAGE, LOT B., J. C. SCOTT-BAKER, G. A. ZAK, E. L. BECKER AND C. F. BAXTER. The effect of variation in filtration rate on the urinary concentrating mechanism in the seal, *Phoca vitulina* L. 107

Palate with cortisone and other hormones, the experimental production of cleft Sup. 1

Paramecium and *Saccharomyces cerevisiae*, some effects of nitrogen mustards on metabolism of *Chilomonas* 237

Paramecium and *Saccharomyces cerevisiae*, the effect of nitrogen mustards on cell division in *Chilomonas* 229

Pelecypod, utilization of dissolved calcium by a 205

Peripheral nerve, enzyme distribution in isolated particulates of rat 379

Periplaneta americana L., the occurrence of β -glucosidase in digestive juice of the cockroach 79

Phases in embryonic development Sup. 1

Phenocopies in chicken embryos, on the chemical production of developmental abnormalities and of. Sup. 1 307

RABBIT smooth muscle, the effect of changing temperature upon the time course of active and of passive lengthening of rabbit smooth muscle 425

Radiation, certain hormones, and radiomimetic drugs on the developing nervous system, the effects of ionizing Sup. 1

Radiation, differentiation and the reaction of rat embryos to Sup. 1

Radiation response of the developing mouse embryo, an analysis of the changing Sup. 1

Radiations on amphibian development, the effect of ionizing Sup. 1

Radiobiological test organism, luminous bacteria as a 415

Radiomimetic drugs on the developing nervous system, the effects of ionizing radiation, certain hormones, and Sup. 1

Radiomimetic substances on embryonic development, with special reference to nitrogen mustards, effects of Sup. 1

Radiotracer techniques in embryological research Sup. 1

RAMOS, J. GARCIA. See Rosenbluth, A. 347

RAO, K. PAMPAPATHI, AND EDWARD D. GOLDBERG. Utilization of dissolved calcium by a Pelecypod 283

Rat embryos to radiation, differentiation and the reaction of Sup. 1

Rat liver, the intracellular distribution of cytochrome components and of oxidative enzyme activity in 57

Rat peripheral nerve, enzyme distribution in isolated particulates of 379

Rathke. See *Limnoria lignorum* 247

Regeneration in corneal epithelium, effect of thyroid hormone on mitosis and 107

Renal excretion of sodium, potassium, and water by the harbor seal (*Phoca vitulina* L.): Effects of apnea; sodium, potassium, and water loading; pitressin; and mercurial diuresis, the 1

Respiration and cell growth in tissue culture, interrelationships between cellular 365

RIGGLE, C. M. See Gellhorn, E. 405

Also see Hyde, J. 293

ROSENBLUETH, A., J. GARCIA RAMOS AND R. MILEDI. The propagation of impulses in myelinated axons 347

RUGH, ROBERTS. The effect of ionizing radiations on amphibian development Sup. 1 39

RUSSELL, F. E. See Harreveld, A. van 335

RUSSELL, LIANA BRAUCH, AND W. L. RUSSELL. An analysis of the changing radiation response of the developing mouse embryo . Sup. 1 103

RUSSELL, W. L. See Russell, Liane Brauch Sup. 1 103

SACCHAROMYCES *cerevisiae*, anaerobic nutrition of 271

Saccharomyces *cerevisiae*, some effects of nitrogen mustards on metabolism of *Chilomonas paramecium* and 229

Saccharomyces *cerevisiae*, the effect of nitrogen mustards on cell division in *Chilomonas paramecium* and Salts and ATP on the membrane potential and mechanical response of muscle, effect of micro-injected 205

Sciatic of the toad, *Bufo marinus*, effects of sheath removal on the 393

Sciatic, sodium exchange through the epineurium of the bullfrog 87

Seal, *Phoca vitulina* L., the effect of variation in filtration rate on the urinary concentrating mechanism in the 99

SHANES, ABRAHAM M. Effects of sheath removal on the sciatic of the toad, *Bufo marinus* 87

SHANES, ABRAHAM M. Sodium exchange through the epineurium of the bullfrog sciatic 99

Sheath removal on the sciatic of the toad, *Bufo marinus*, effects of 271

SCHRANK, A. R. See Mills, Kenneth S.

SMELSER, GEORGE K., AND V. OZANICS. Effect of thyroid hormone on mitosis and regeneration in corneal epithelium 107

Sodium exchange through the epineurium of the bullfrog sciatic 99

STIER, T. J. B. See Andreassen, A. A.

Stimulation of the motor cortex and their influence on the activity of single motor units, summation, inhibition, and proprioceptive reinforcement under conditions of 405

Stimulation of the motor cortex in the macaque, the dependence of unit discharges on frequency and intensity of 293

STREITMATTER, CORNELIUS F., AND ERIC G. BALL. The intracellular distribution of cytochrome components and of oxidative enzyme activity in rat liver 57

Study of the outcome of pregnancy in women exposed to the atomic bomb blast in Nagasaki, a Sup. 1 319

Summarizing remarks Sup. 1 329

Summation, inhibition, and proprioceptive reinforcement under conditions of stimulation of the motor cortex and their influence on the activity of single motor units 405

TEMPERATURE upon the time course of active and of passive lengthening of rabbit smooth muscle, the effect of changing 425

Thyroid hormone on mitosis and regeneration in corneal epithelium, effect of 107

Tissue culture, interrelationships between cellular respiration and cell growth in 365

Toad, *Bufo marinus*, effects of sheath removal on the sciatic of the 87

ULTRAVIOLET irradiation, electrical and curvature responses of the *avena coleoptile* to unilateral 39

Unit discharges on frequency and intensity of stimulation of the motor cortex in the macaque, the dependence of 293

Unsaturated fatty acid requirement for growth in a defined medium 271

Urinary concentrating mechanism in the seal, *Phoca vitulina* L., the effect of variation in filtration rate on the 257

Utilization of dissolved calcium by a Pelecyopod 283

VITAMIN deficiencies, disturbance of embryonic development by maternal Sup. 1 207

WALKER, B. E. See Fraser, F. Clarke Sup. 1 237

WARKANY, JOSEF. Disturbance of embryonic development by maternal vitamin deficiencies Sup. 1 207

WEISS, PAUL. Summarizing remarks Sup. 1 329

WHIPPLE, G. HOYT. Luminous bacteria as a radiobiological test organism 415

WILLIIE, B. H. Phases in embryonic development Sup. 1 307

WILSON, JAMES G. Differentiation and the reaction of rat embryos to radiation Sup. 1 11

WRIGHT, ERNEST B., AND PAUL D. COLEMAN. Excitation and conduction in crustacean single motor axons 133

WRIGHT, ERNEST B., AND WILLIAM J. ADELMAN. Accommodation in three single motor axons of the crayfish claw 119

WRIGHT, PHYLLIS M. See Yamazaki, James N. Sup. 1 319

WRIGHT, STANLEY W. See Yamazaki, James N. Sup. 1 319

YAMAZAKI, JAMES N., STANLEY W. WRIGHT AND PHYLLIS M. WRIGHT. A study of the outcome of pregnancy in women exposed to the atomic bomb blast in Nagasaki Sup. 1 319

ZAK, G. A. See Page, Lot B. 257

